

FLOOD PLAIN INFORMATION

ASSABET RIVER

WESTBOROUGH TO WEST CONCORD, MASSACHUSETTS

(SUMMARY REPORT)



**DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.**

JUNE 1966

This Study requested by the Commonwealth of Massachusetts

FLOOD PLAIN INFORMATION
ASSABET RIVER
WESTBOROUGH TO WEST CONCORD
MASSACHUSETTS

SUMMARY REPORT

This study, authorized under Section 206,
Public Law 86-645, was requested by the
Commonwealth of Massachusetts

Department of the Army
New England Division, Corps of Engineers
Waltham, Mass.

June 1966

INTRODUCTION

Since time began, heavy rains and melting snows have periodically changed small brooks and peaceful rivers into raging torrents which overflow their banks and endanger whatever lies on the nearby lowland. Before man found reason to build and live on these plains, floods were of little consequence; but with the coming of civilization and the occupation of these lands, floods frequently result in disaster to individuals, their families and their communities.

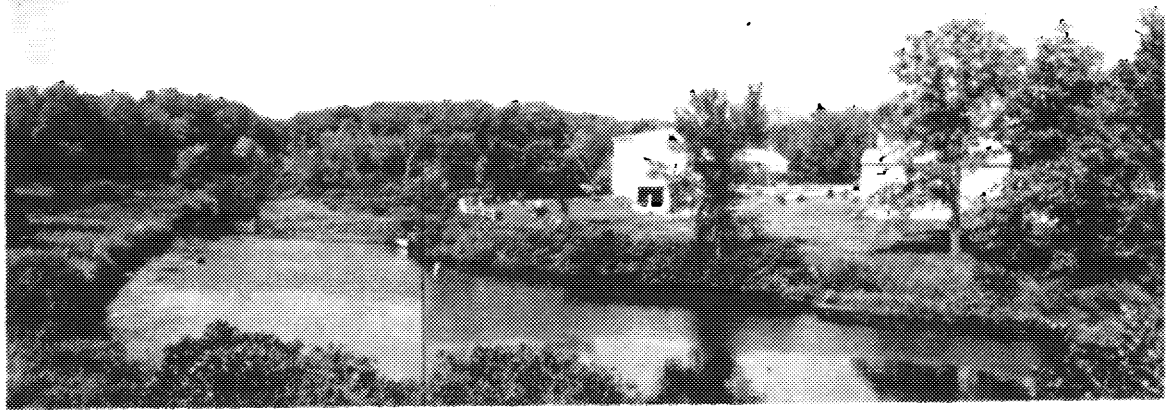
In terms of geological time, severe floods are a frequent occurrence. In terms of a man's life, they are rare - rare enough to dull the memories of destruction and to allow him to build on land which he is vaguely aware may possibly be subject to some sort of flood hazard.

During the last 25 years, the Federal Government has spent huge sums of money to reduce the human suffering and property damages that are caused by floods. The dikes, floodwalls and flood control reservoirs that have resulted have more than paid for themselves. Nonetheless, flood losses today are as great, if not greater, than ever before because of man's continuing encroachment on the flood plain. People, often without realizing the risk, are constructing new developments in flood-prone areas and are reducing channel capacities by filling in flood channel areas. Examples can be found in most every riverside community. Flood hazards are thereby increased and the effectiveness of existing flood control works is correspondingly diminished.

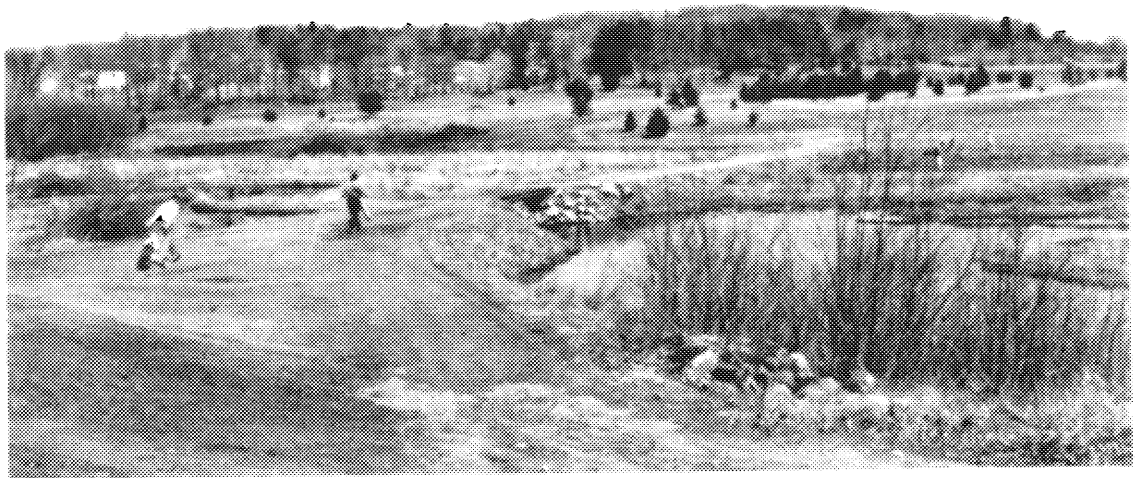
Much of the development in the flood plain of the Assabet River was completed prior to the record flood of 1955 and has been affected in varying degrees by past floods. Examples of poor use and wise use of the flood plain are shown in the photos on the next page. Evidently, some people in the valley have not profited by the tragic experiences of others and new homes have been built in the flood plain. If this type of development is permitted to go uncontrolled and filling of the flood plain allowed, a general disaster could occur with the next flood.

To assist communities in preventing future flood damages, Congress has authorized the Corps of Engineers to publish information on flood hazards and make criteria available for planning the use of areas subject to flooding. In addition, the Commonwealth of Massachusetts has enacted a Zoning Enabling Act giving the towns the authority to establish zoning laws controlling the use of the flood plains.

At the request of the Water Resources Commission of the Commonwealth of Massachusetts, a flood plain information report has been prepared by the Corps of Engineers for the Assabet River from Westborough to West Concord. That report is intended to help the towns in establishing flood plain regulations and to aid property owners in weighing the advisability of further development in the flood plain. Copies of that report are available for inspection at the office of the Town Clerk in each town and also the Water Resources Commission, State Office Building, 100 Cambridge Street, Boston, Massachusetts, 02202. This pamphlet has been prepared



Poor use of the flood plain



Wise use of the flood plain

for a wider distribution to make the public aware of the continuing flood problem along the Assabet River and to help insure that future development will be made with the knowledge of the potential flood risks and hazards.

FLOOD PROBLEM

In the long history of flooding along the Assabet River, the flood that stands out in everyone's memory occurred in August 1955. It resulted from hurricane "Diane" which deposited more than 10 inches of rainfall over the basin in about a 36-hour period.

Since that flood, the Soil Conservation Service of the U. S. Department of Agriculture has developed a flood control work plan and has constructed some of the structures. The maps included in this pamphlet show the areas that will be flooded if a storm similar to August 1955 were to recur today, assuming that the complete flood control work plan was constructed as proposed.

Although the August 1955 flood is considered to be the worst in the memory of the local people, any planning should recognize the probability of a greater flood. The standard project flood shown on the maps is an event which will be equalled or exceeded on rare occasions. This flood which is considered to be a measure of the flood potential of the Assabet River is normally used by the Corps of Engineers in the design of dikes, floodwalls and channel improvements in highly developed areas. The estimated standard project flood shown on the maps includes the effectiveness of the flood control structures.

The maps shown on plates 2 through 11 show only the limits of the flooded areas. To determine the depth of flooding on a particular piece of property, one must compare the ground elevation in question with the flood profiles also shown on the same plates. The modified 2% annual probability flood shown on the profiles is a condition that is estimated to recur about twice in the next 100 years, or on the average about once in 50 years. Consequently, every year there is a 2 percent chance of occurrence for a flood of this size.

All the floods shown are intended to serve only as guides. The estimates of future flooding by their nature cannot be exact but do give reasonable probabilities of flooding based on past records. There can, of course, be no assurance that a flood comparable to the standard project flood will not occur in the near future nor can it be guaranteed that floods comparable to those experienced will not occur in two consecutive years.

There is sufficient flood-free land in the several communities to accommodate the residential growth without using the flood plain of the Assabet River. However, commercial or industrial expansion may prefer land adjacent to existing development or major highways bordering or in the flood plain. Too often, developers seem to overlook the detrimental factors when estimating the value of a flood plain site. It therefore appears that some local guidance or control is desirable to achieve orderly growth of the communities and preclude the suffering from floods and the need for costly flood control improvement.

WHAT CAN BE DONE

The ultimate goal of flood plain regulations is to provide for optimum land use consistent with flood hazards and industrial growth. This requires the evaluation of certain costs not associated with upland development such as cost of protection, floodproofing, higher insurance rates and possible flood losses. In addition to costs, the effect of obstructions such as land fill must be analyzed to determine that it will not create new flood problems for others upstream and downstream.

The problems of filling a flood plain are twofold. First, if the flood plain is relatively narrow, filling would reduce the cross section of the valley thereby raising the upstream river elevation and causing additional damage. Second, if the flood plain is wide, it acts as a temporary reservoir when it becomes flooded. If this land was to be filled, the loss of the storage area can worsen downstream flood conditions. Consequently, for this reason and other conservation measures, the Commonwealth of Massachusetts in the Act of 1965, passed the Hatch Act (chapter 220) which prohibits any person from removing, filling or dredging any bank, flat, marsh, meadow or swamp bordering on any inland waters without filing written notice of his intentions.

Once the degree of risk has been recognized, consideration may be given to retaining the lower levels of the flood plain for "open use" such

as parking areas, parks and recreation areas. Any structure permitted would be the type that could be flooded without serious consequence. In the higher elevations, structures for commercial or industrial use might be permitted, provided they are structurally sound, waterproof and cause no serious restriction to the movement of floodwaters.

The objectives of such a program can be achieved in many ways.

The more common are:

Encroachment Lines. The Commonwealth of Massachusetts and the towns have the authority to establish lines along the river beyond which no obstruction or encroachment may be made without a permit.

Zoning. The towns have the authority to establish zoning similar to other types of zoning authorized for the health, safety and general welfare of the community.

Subdivision Regulation. With zoning in effect, subdivision regulations can be amended to control uses in the flood plain.

Building Codes. These ordinances can establish requirements that will insure that buildings are waterproof and will not float off their foundations.

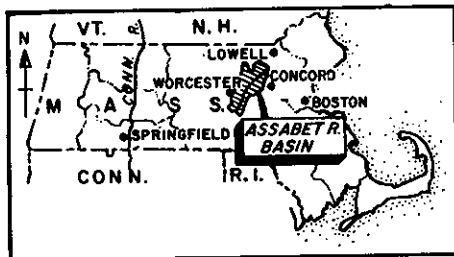
Others. The towns could purchase some of the lands and combined with an open space conservation program form an effective means of controlling the flood plain. In addition, financial institutions may assist by denying funds for projects in which they estimate the flood risk to be too great.

Other means of reducing flood damages for existing conditions would be to modify structures to make them flood proof, keep channels clear of debris or fallen trees which may pile up against bridges and thereby create temporary dams and also maintain an efficient warning and evacuation system incorporated with Civil Defense measures. The flood warning system should be coordinated with the U.S. Weather Bureau office at Bradley Field, Windsor Locks, Connecticut.

However, due to the small drainage area of the Assabet, the most that can be expected would be a regional forecast of "possible flash flooding in small streams in Massachusetts." With this type of warning the police or the local Civil Defense would be on an alert status. Staff gages installed by local interests at two or three locations along the river would provide a visual index of the rate of rise. It would then be possible to prescribe critical elevations at which time certain areas should be evacuated before the flood was at its worst.

Long-range planning to reduce future flood damages and still allow for orderly growth of the communities will require cooperation and coordination among the towns and the Commonwealth of Massachusetts. It has been shown time and time again that preventive measures must be taken in advance of an emergency, for once a flood has started counter measures are usually too late to be effective. It is therefore urged that past lessons be remembered. Rivers when on a rampage have a habit of asserting their own real estate rights in flood plain areas.

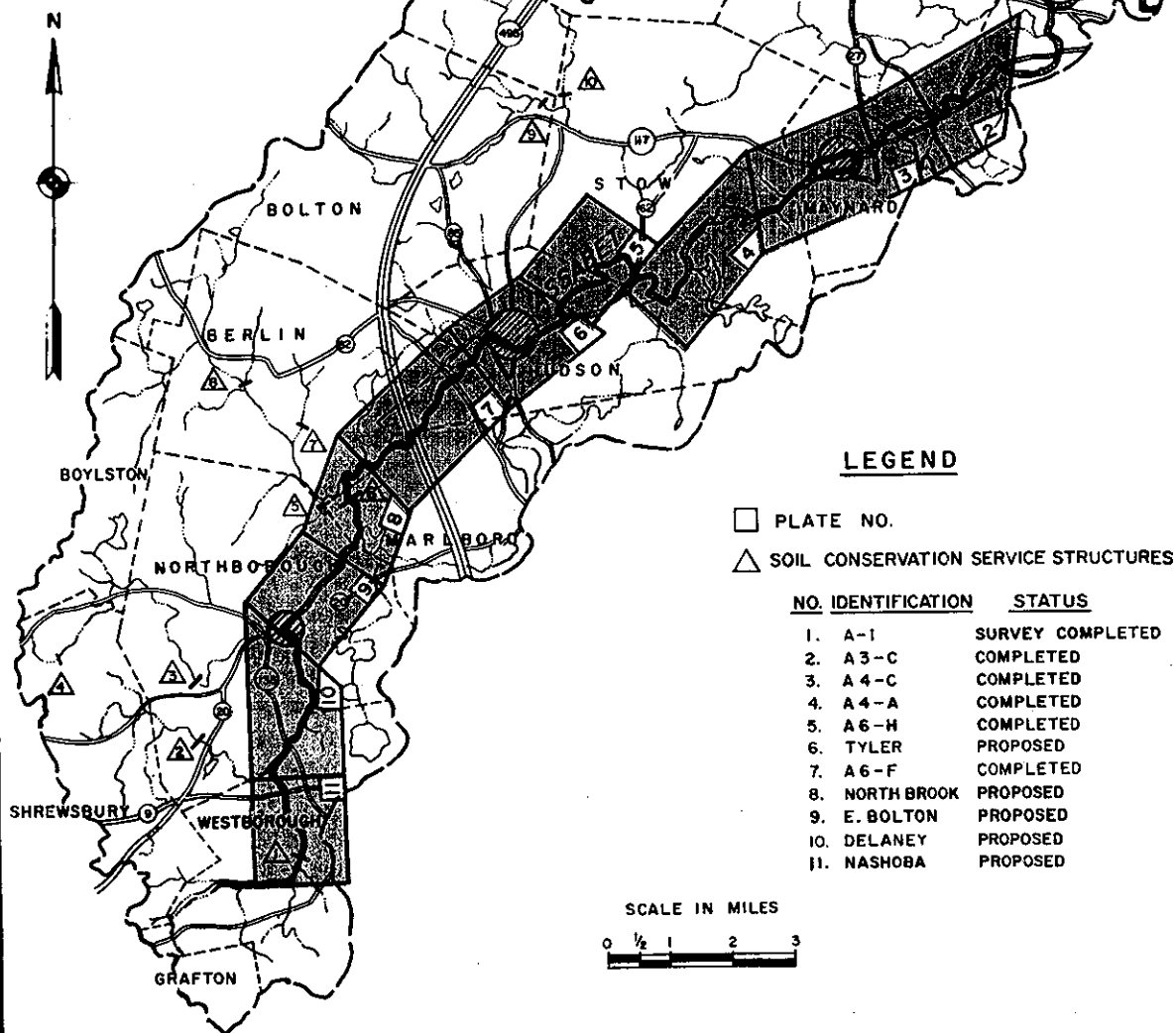
"IT WASN'T RAINING WHEN NOAH BUILT THE ARK"



LOCATION MAP

SCALE IN MILES

25 0 50 75 100



LEGEND

□ PLATE NO.

△ SOIL CONSERVATION SERVICE STRUCTURES

NO.	IDENTIFICATION	STATUS
1.	A-1	SURVEY COMPLETED
2.	A3-C	COMPLETED
3.	A4-C	COMPLETED
4.	A4-A	COMPLETED
5.	A6-H	COMPLETED
6.	TYLER	PROPOSED
7.	A6-F	COMPLETED
8.	NORTH BROOK	PROPOSED
9.	E. BOLTON	PROPOSED
10.	DELANEY	PROPOSED
11.	NASHOBA	PROPOSED

SCALE IN MILES

0 1/2 1 2 3

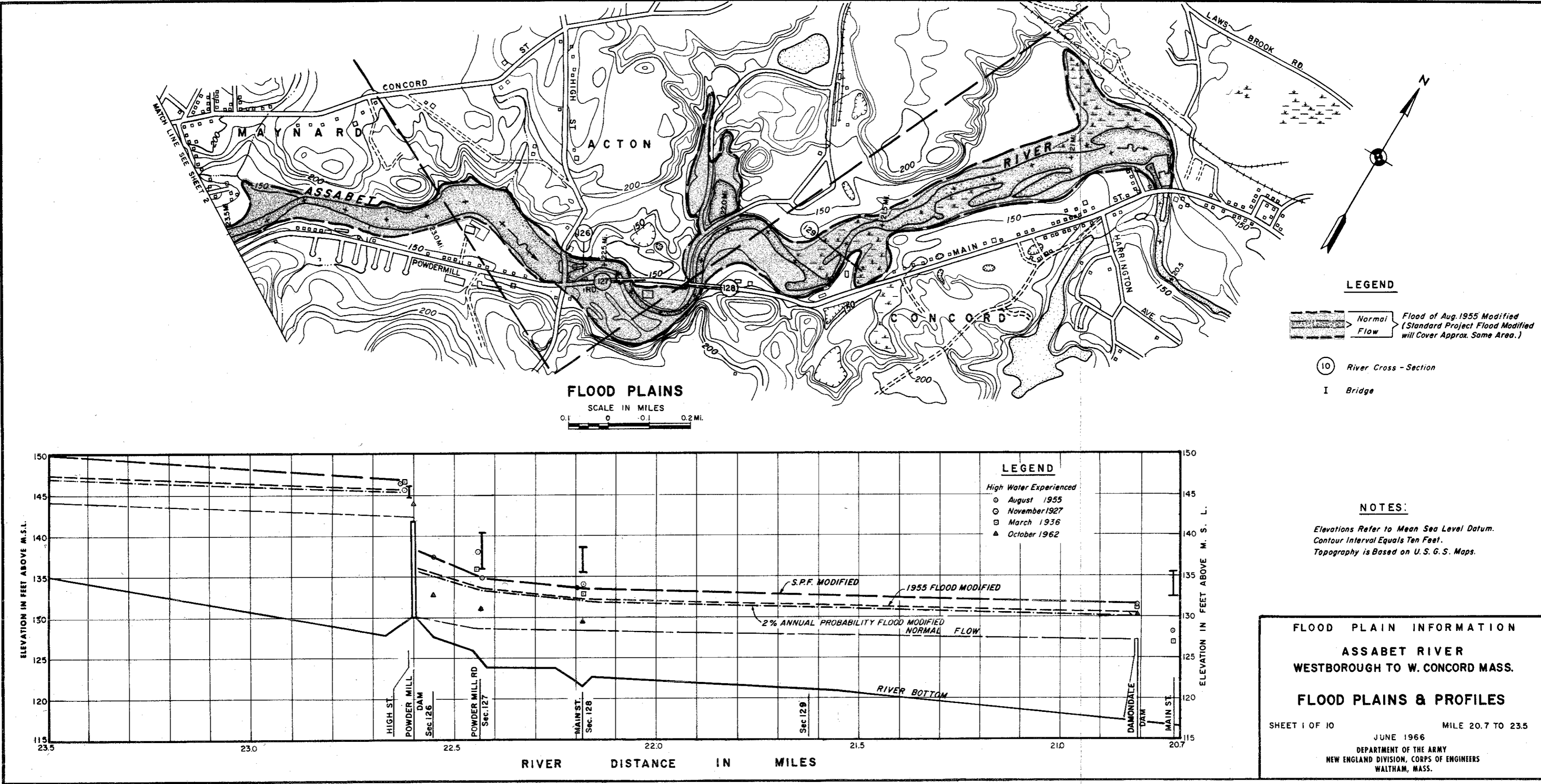
FLOOD PLAIN INFORMATION
ASSABET RIVER
WESTBOROUGH TO W. CONCORD MASS.

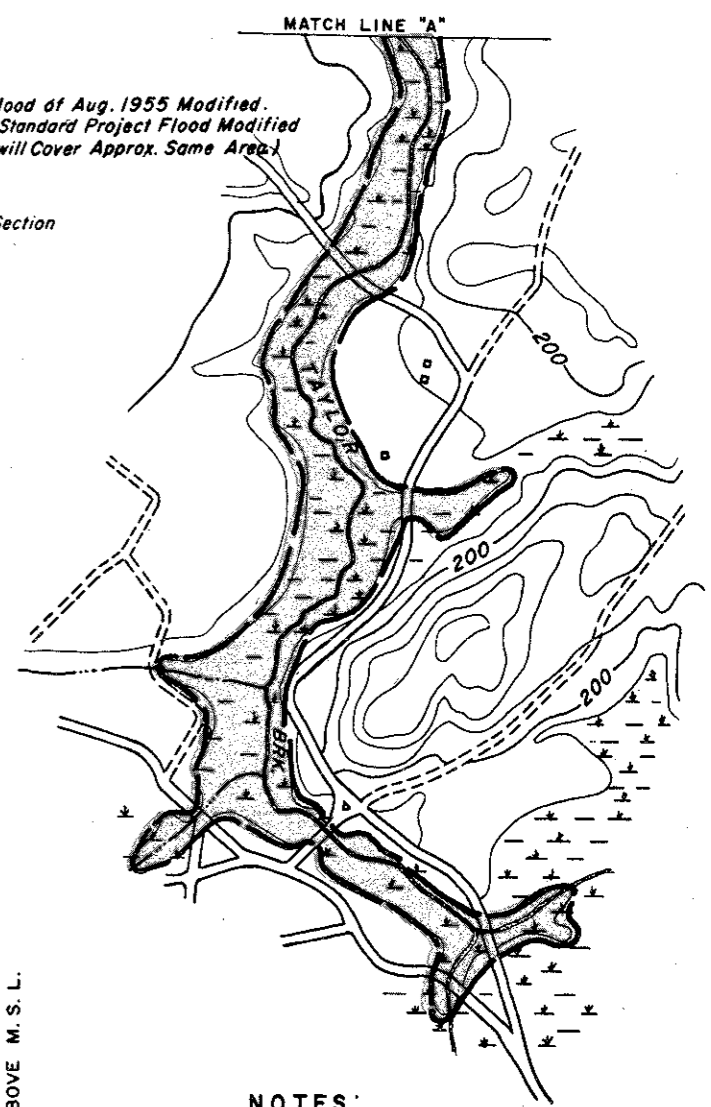
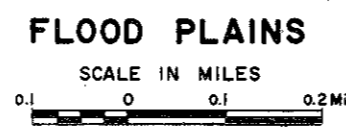
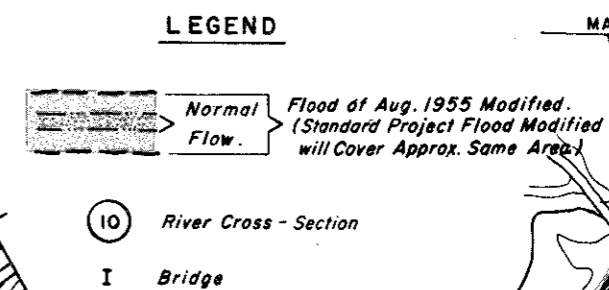
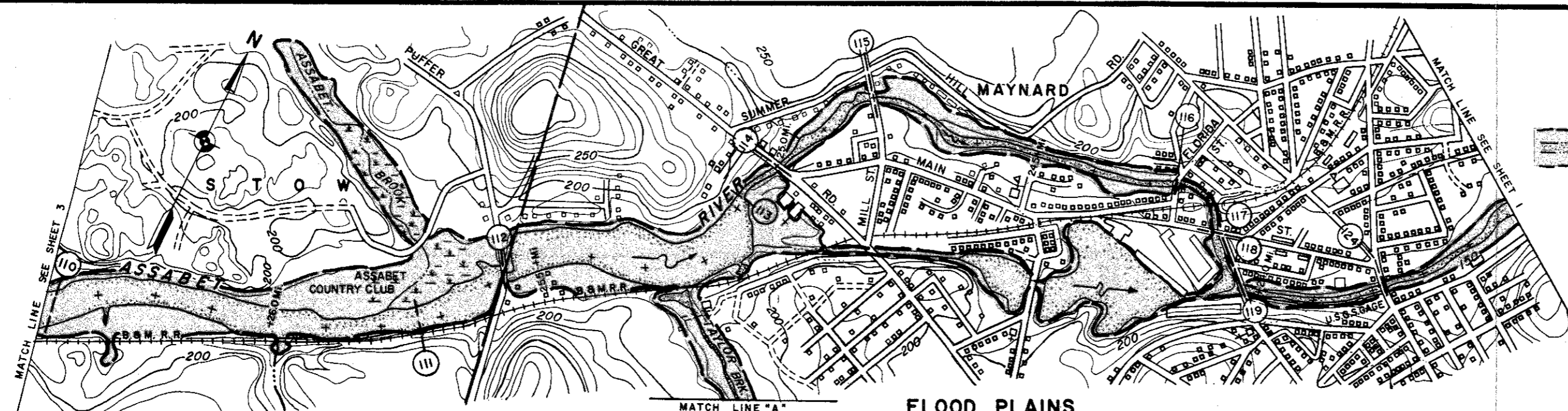
BASIN & INDEX MAP

JUNE 1966

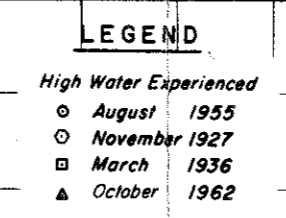
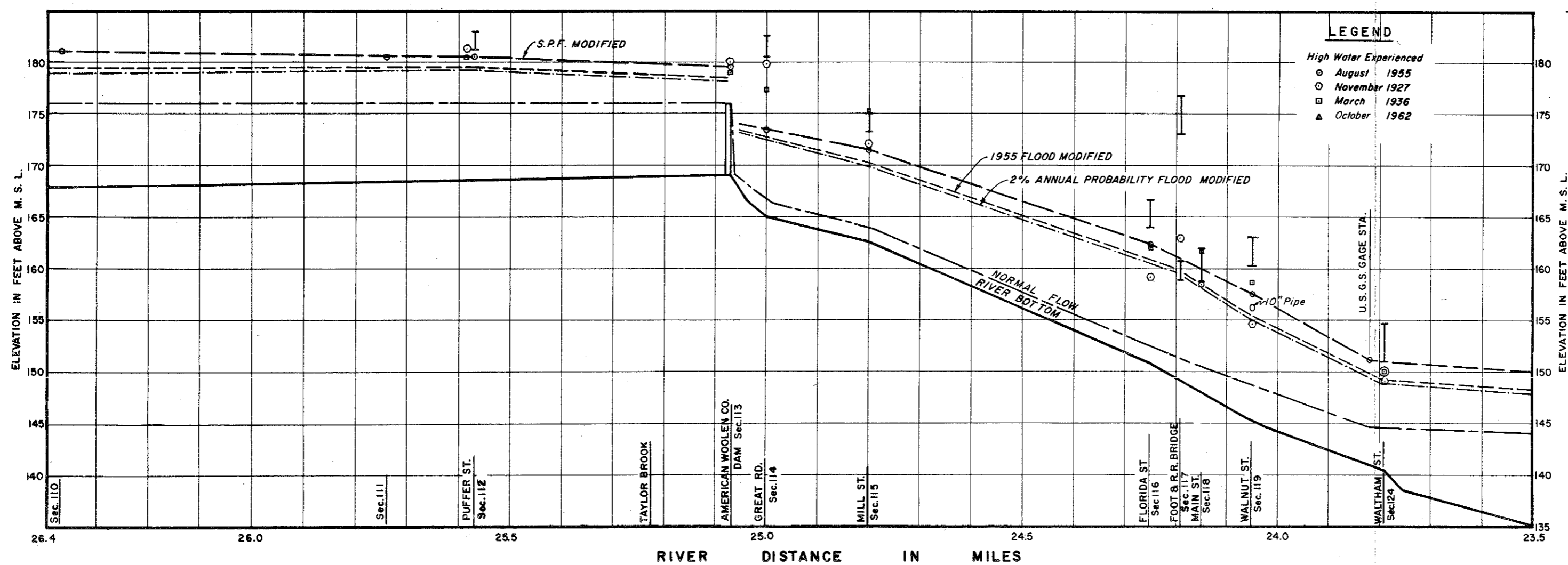
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

PLATE NO. I





NOTES:
Elevations Refer to Mean Sea Level Datum.
Contour Interval Equals Ten Feet.
Topography is Based on U. S. G. S. Maps.



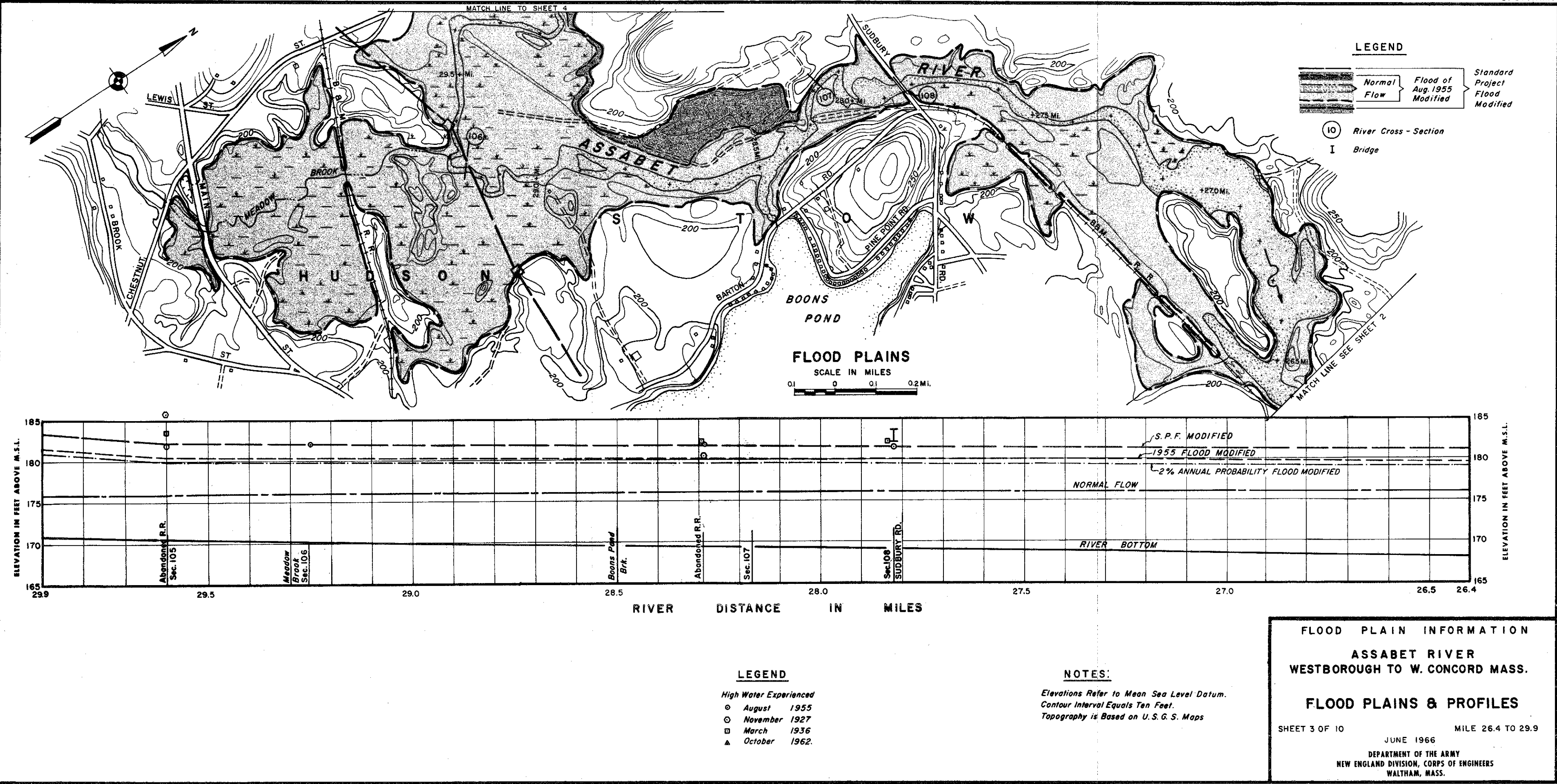
FLOOD PLAIN INFORMATION

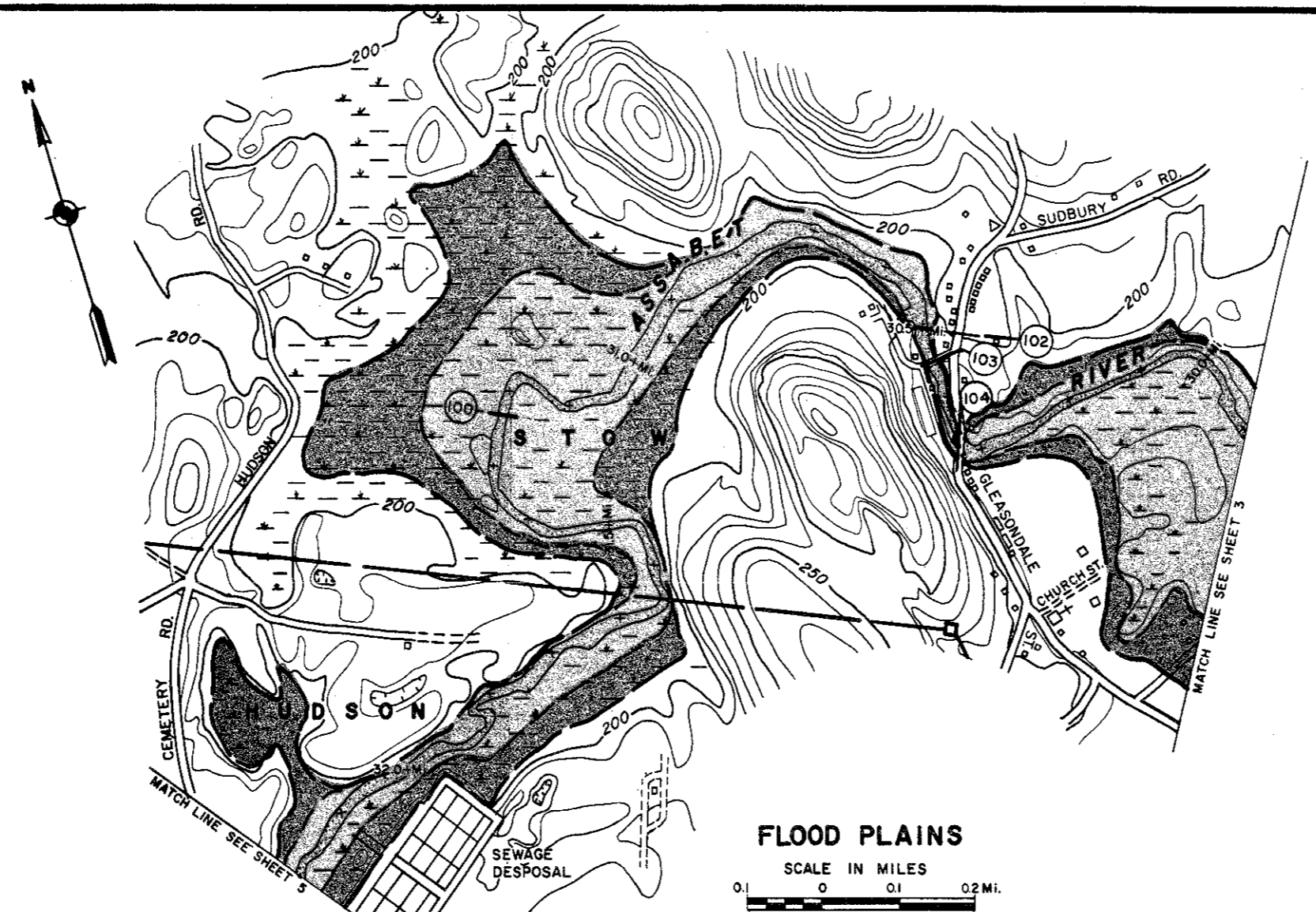
ASSABET RIVER
WESTBOROUGH TO W. CONCORD, MASS.

FLOOD PLAINS & PROFILES

SHEET 2 OF 10 JUNE 1966 MILE 23.5 TO 26.4

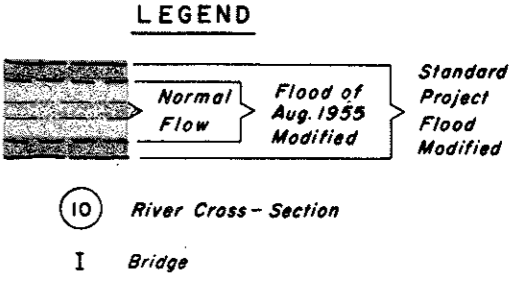
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.



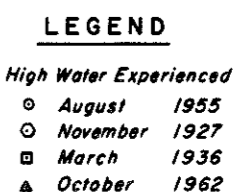
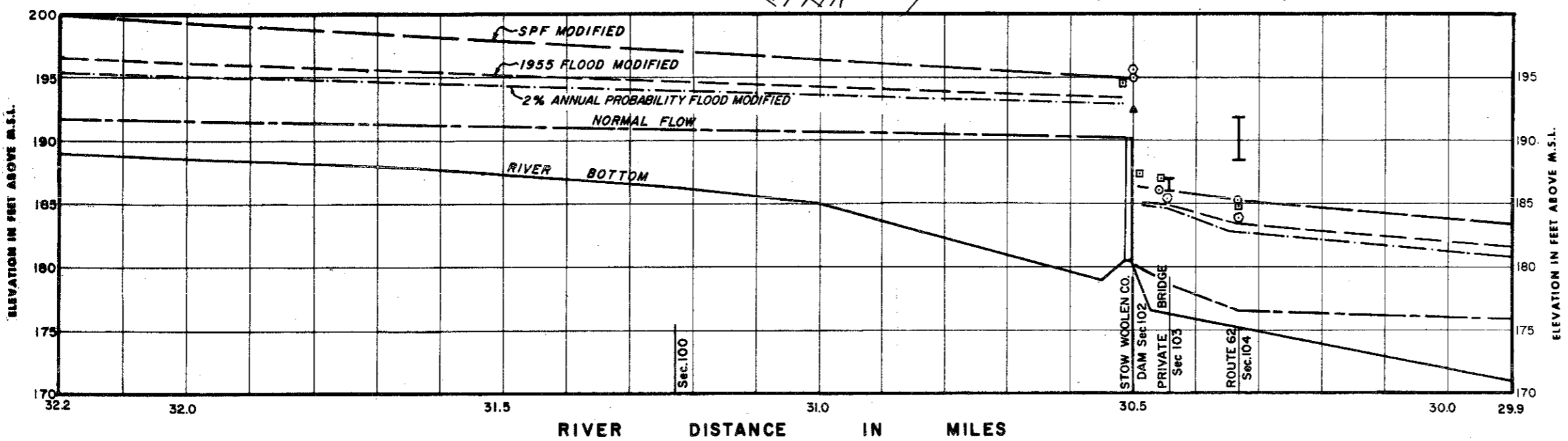


FLOOD PLAINS

SCALE IN MILES
0.1 0 0.1 0.2 Mi.



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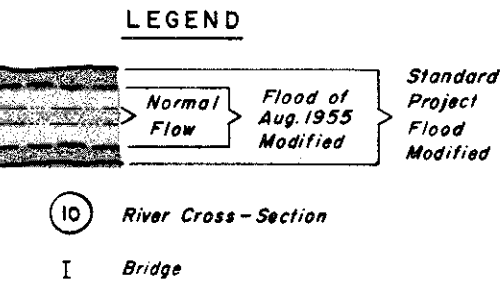
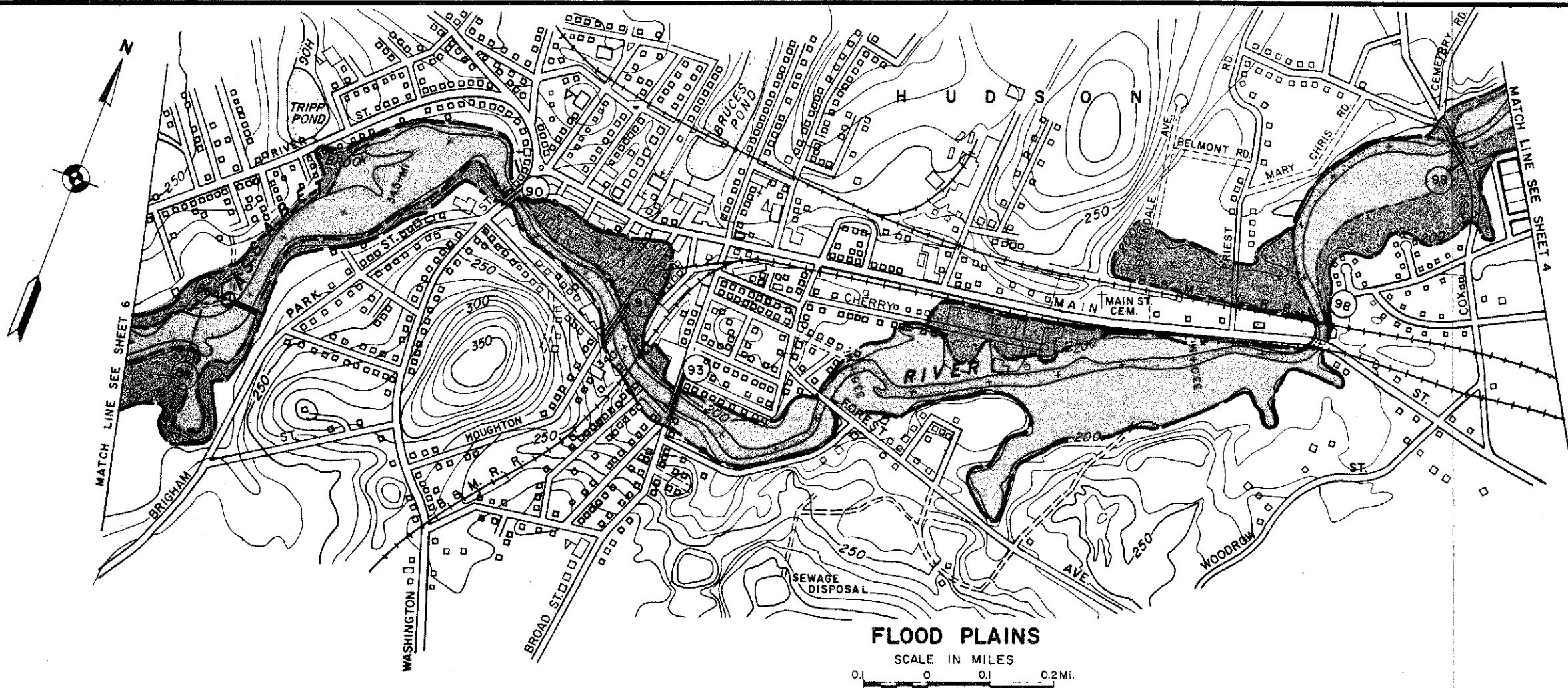
FLOOD PLAIN INFORMATION

ASSABET RIVER
WESTBOROUGH TO W. CONCORD MASS.

FLOOD PLAINS & PROFILES

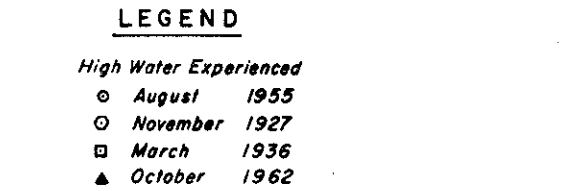
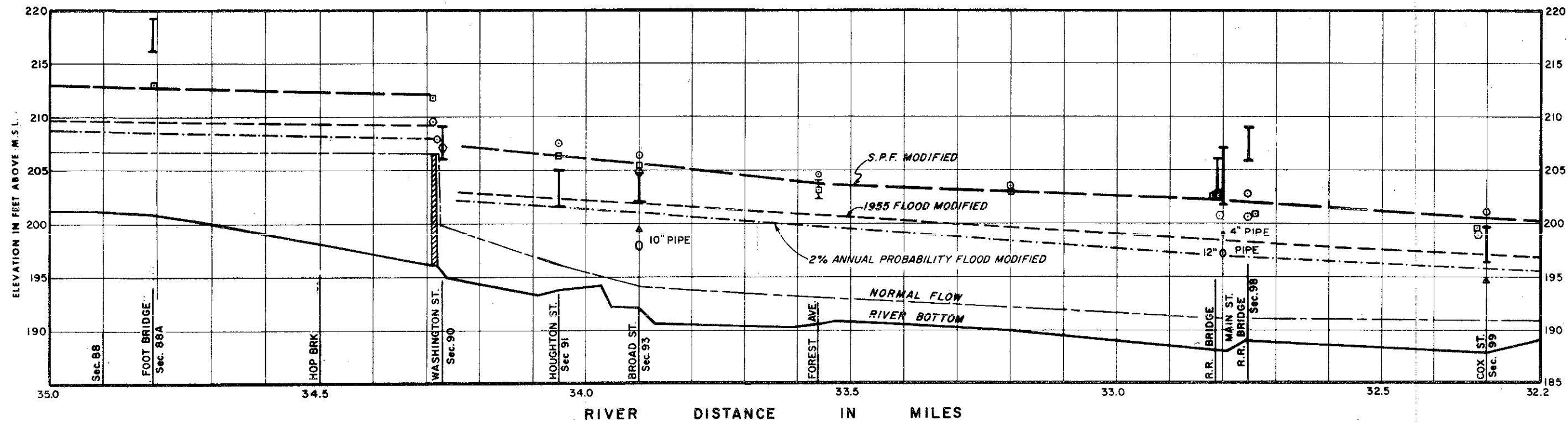
SHEET 4 OF 10 MILE 29.9 TO 32.2

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WALTHAM, MASS.



NOTES:

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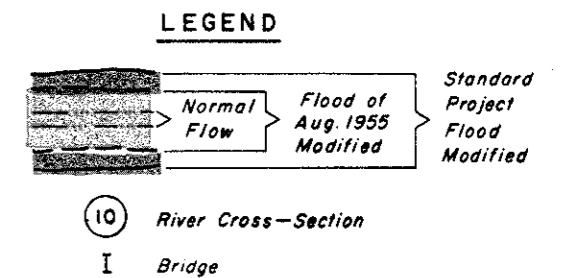
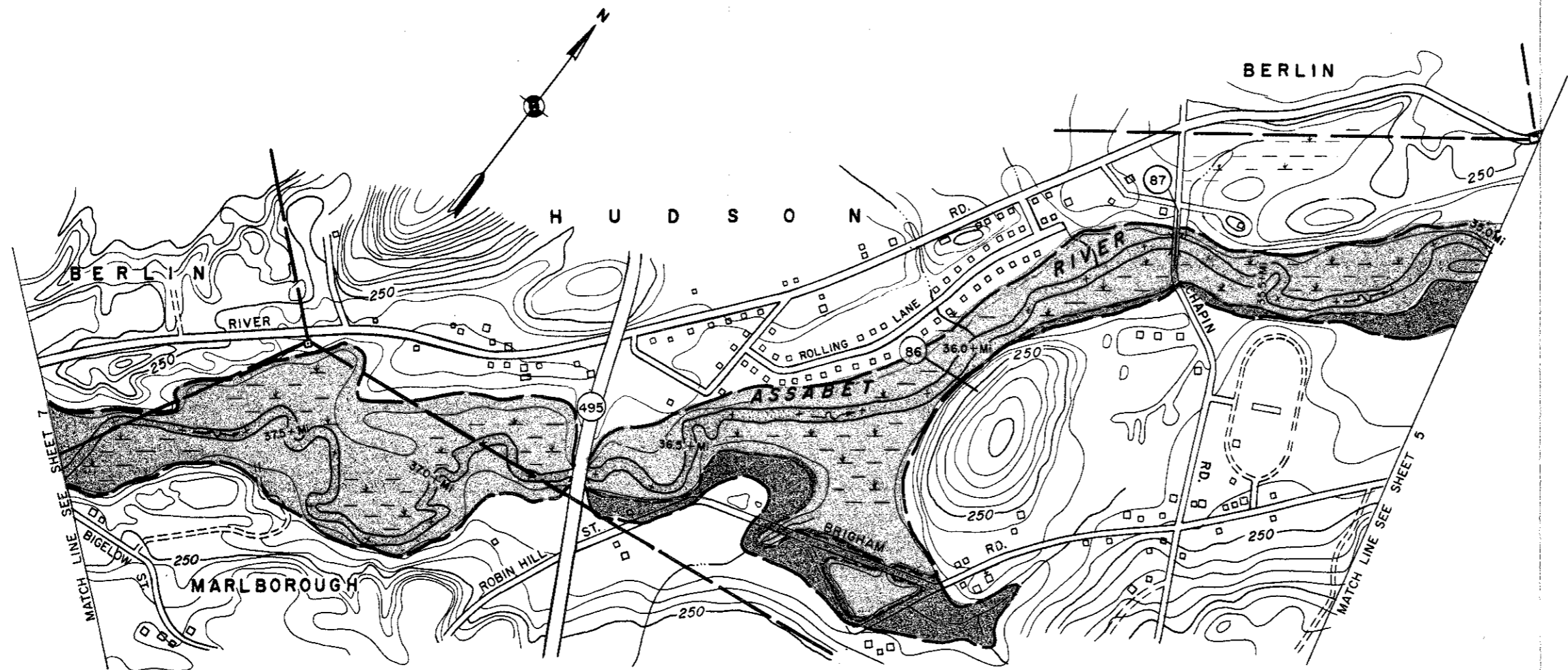
FLOOD PLAIN INFORMATION

ASSABET RIVER
WESTBOROUGH TO W. CONCORD MASS.

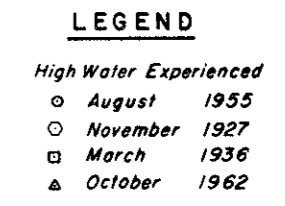
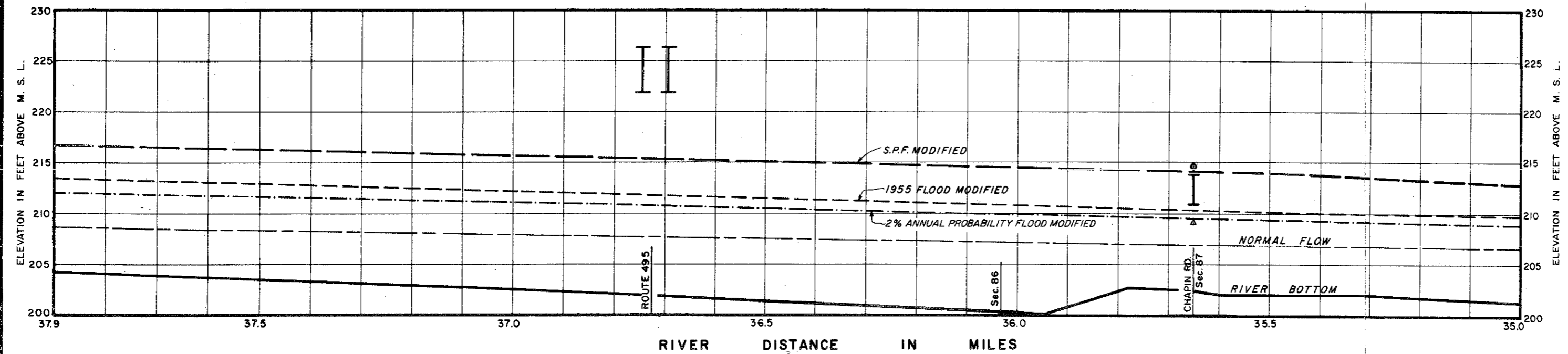
FLOOD PLAINS & PROFILES

SHEET 5 OF 10 MILE 32.2 TO 35.0

JUNE 1966
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NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.



NOTES:
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FLOOD PLAIN INFORMATION

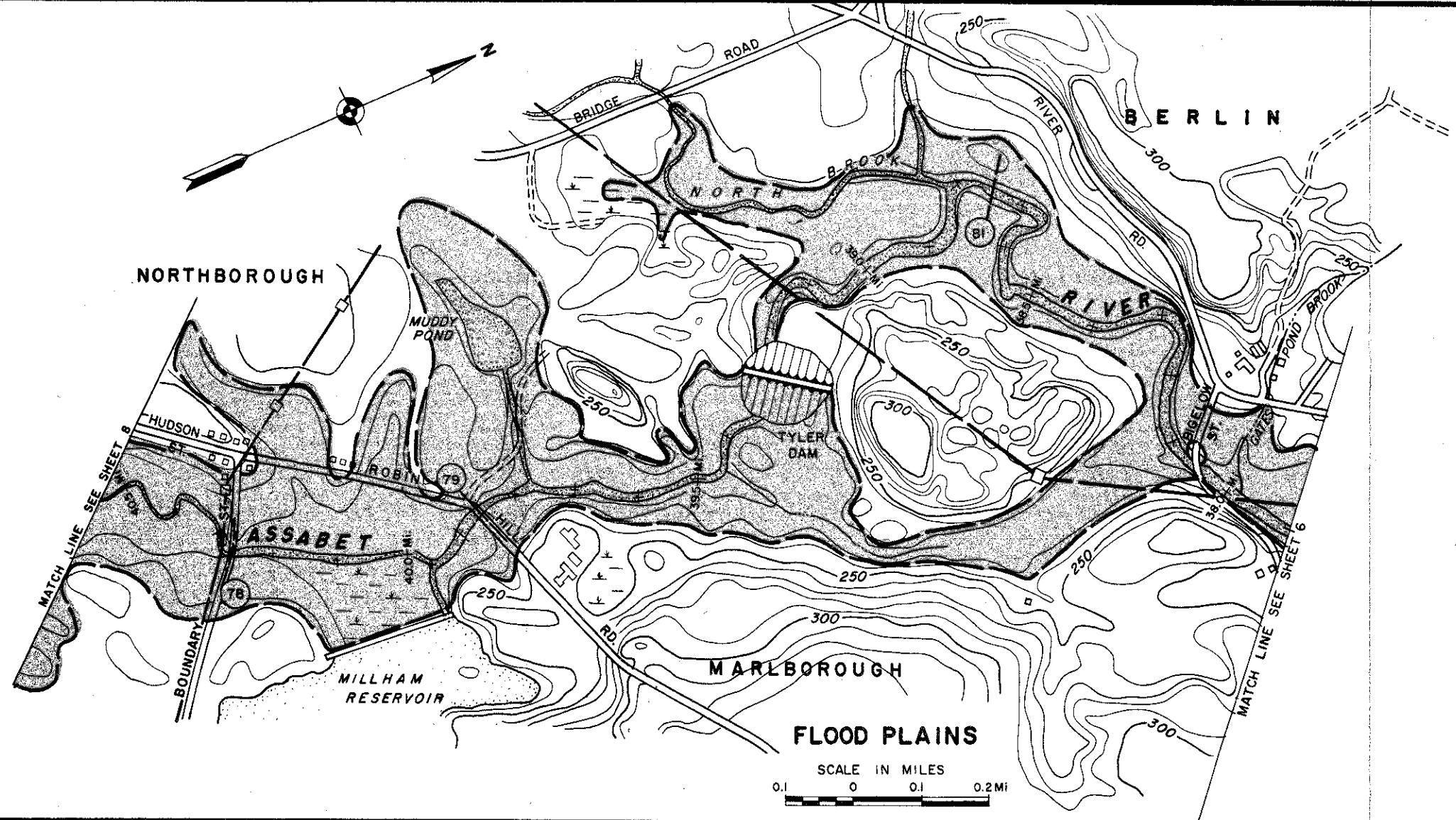
ASSABET RIVER
WESTBOROUGH TO W. CONCORD MASS.

FLOOD PLAINS & PROFILES

SHEET 6 OF 10 MILE 35.0 TO 37.9

JUNE, 1966

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WALTHAM, MASS.



LEGEND

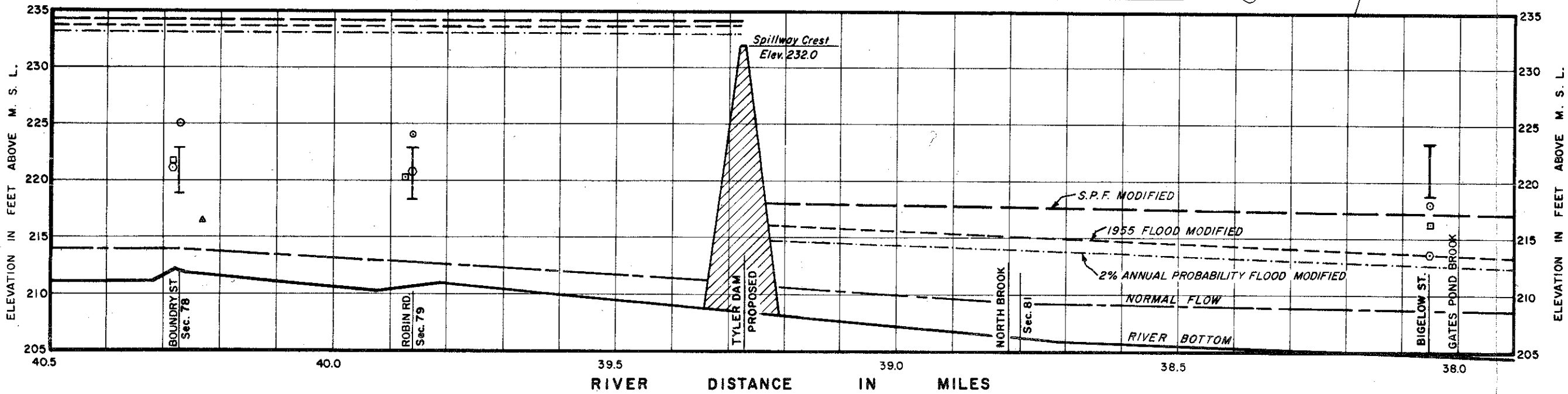
- Normal Flow
 - River Cross - Section
 - Bridge
- Flood of Aug. 1955 Modified (Standard Project Flood Modified will Cover Approx. Same Area.)*

NOTES:

Elevations Refer to Mean Sea Level Datum
Contour Interval Equals Ten Feet.
Topography is Based on U. S. G. S. Maps.

LEGEND

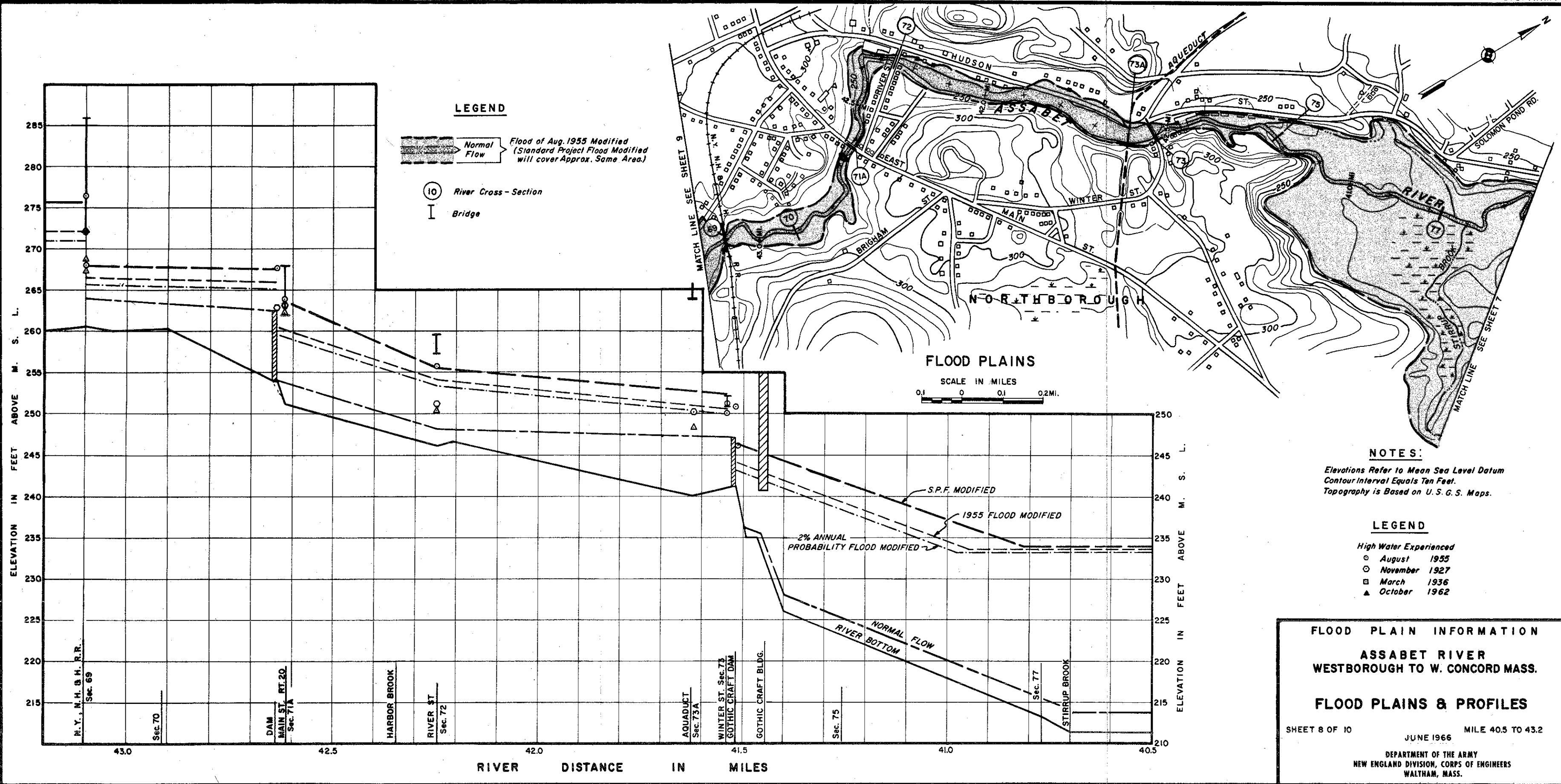
- High Water Experienced
- August 1955
 - November 1927
 - March 1936
 - October 1962



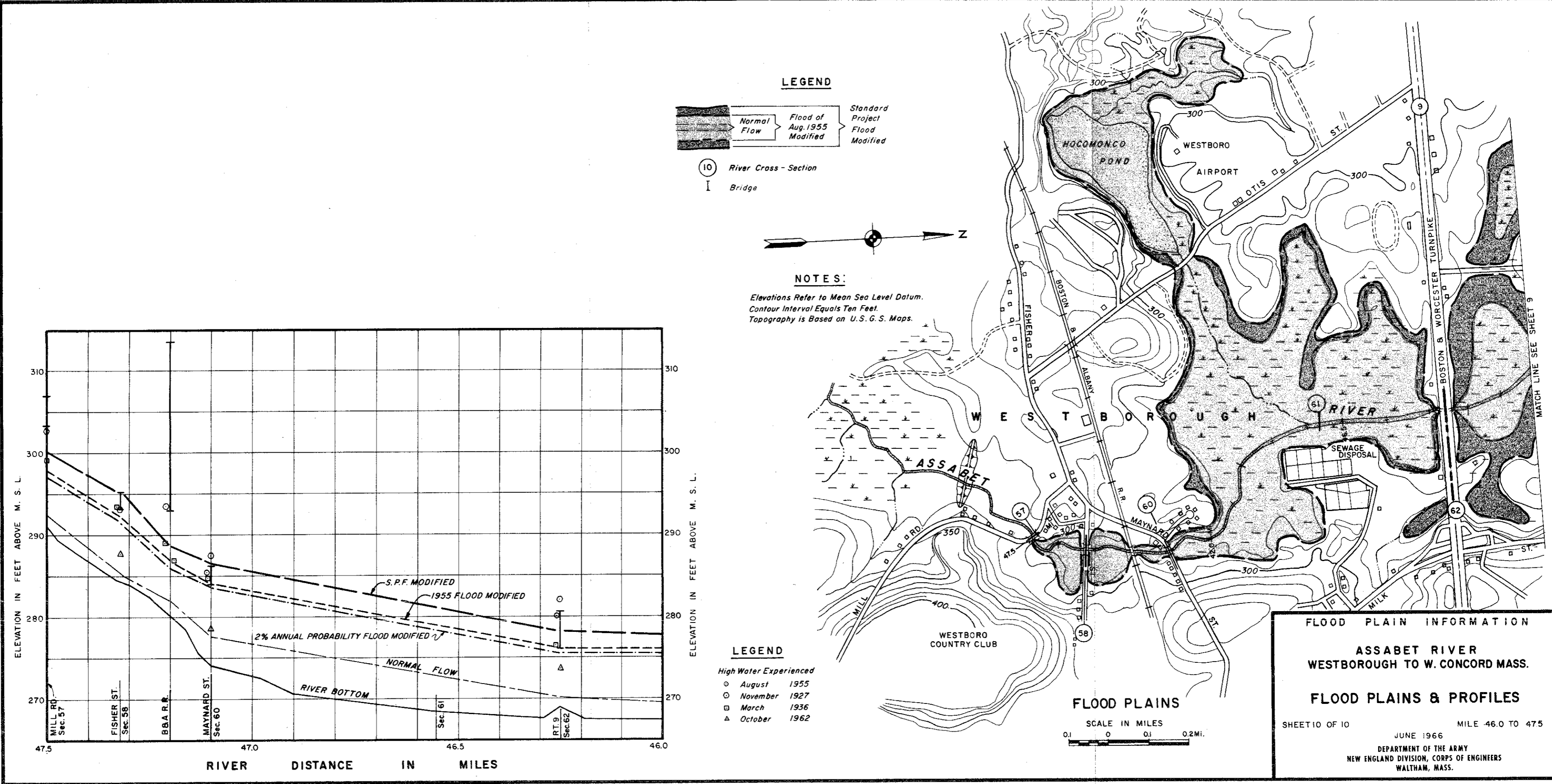
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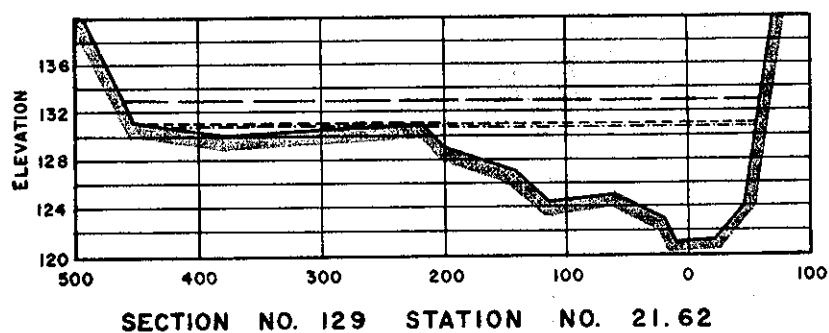
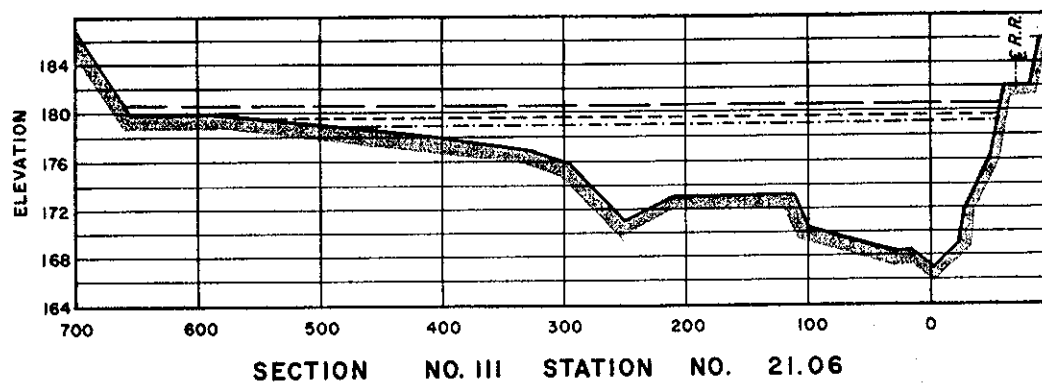
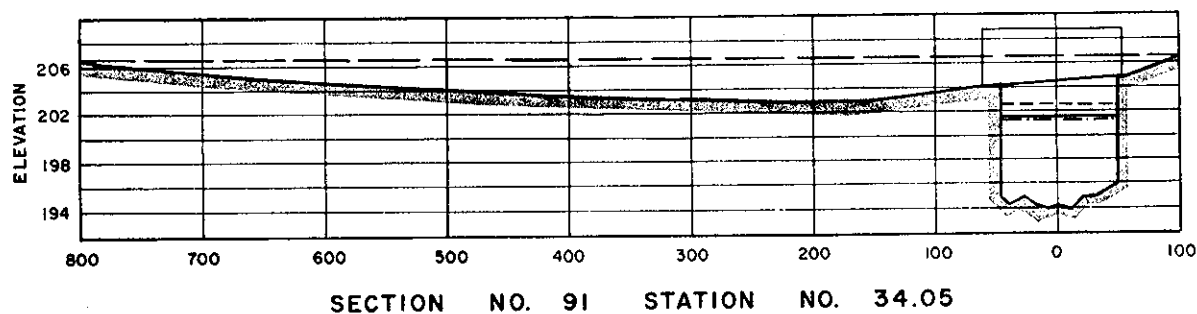
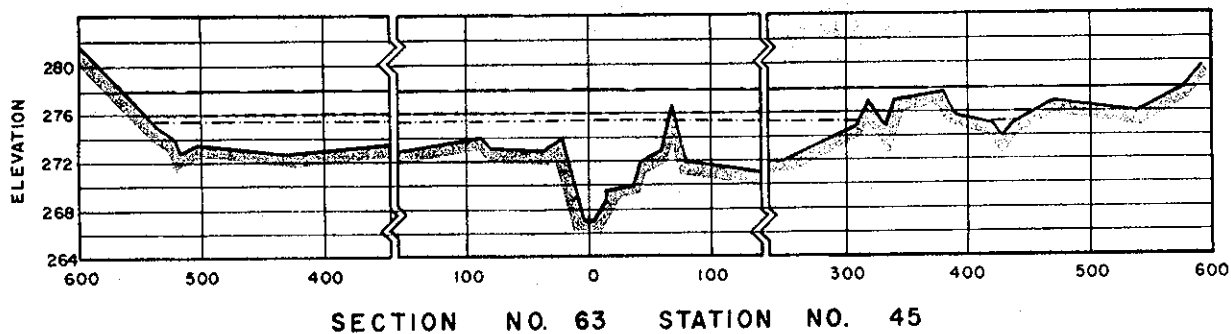
FLOOD PLAINS & PROFILES

SHEET 7 OF 10
JUNE 1966
MILE 37.9 TO 40.5
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.







**LEGEND**

Standard Project Flood Modified ———
 1955 Flood Modified - - - - -
 2% Annual Probability
 Flood Modifield

NOTES

Sections taken looking downstream.
 Horizontal distances in feet.
 Elevations in feet (Mean Sea Level Datum)

FLOOD PLAIN INFORMATION

ASSABET RIVER
 WESTBOROUGH TO W. CONCORD, MASS.

TYPICAL CROSS SECTIONS

JUNE 1966

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 NEW ENGLAND DIVISION, CORPS OF ENGINEERS
 WALTHAM, MASS.